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tation of the part played by bacteria in disease, and gives many facts which fully support his conclusions. Dr. Smith's elaborately illustrated paper is better than most of the American diatom literature, as it deals with structure rather than with "resolution." The papers upon the detection of adulterated butter seem conclusive that the microscope alone is not sufficient to decide in all cases, or, at least, until new tests are discovered.

There can be no doubt that this society is doing a good work, and while it is the means of publishing much that is crude, and which might better be left in manuscript, it still serves as a centre for many who otherwise would not belong to any scientific association. To the charge that sufficient censorship is not exercised in the acceptance of papers for publication, the much larger American Association for the Advancement of Science is equally open. Indeed, such criticism applies with much more force to the latter than to the former association, for with a total of about three hundred and seventy-five members the Microscopical Society have a very substantial financial balance on hand, while the larger American Association, with a membership of eighteen hundred and eighty-six, are several thousand dollars in debt.

The Fourth Report of the Bureau of Ethnology.¹—The present volume keeps up the high standard of the series and deserves more space than our limits will allow. The report proper of the director details the operations of the bureau in the fiscal year 1882-83, while the accompanying papers, five in number, have far more general interest. Two more papers were prepared for the present volume,—one by Professor Cyrus Thomas on the burial mounds of the Northern United States, the other by Charles C. Royce on the relations of the Cherokees to the colonial governments,—but were postponed to the next volume from lack of room. The first of the papers now before us is confessedly a preliminary study by Colonel Garrick Mallery of the picture-writing of the North American Indians. In it no conclusions are drawn, but the paper, which is fully illustrated, aims to present the material already collected as a guide for future collections. Notwithstanding this fact the paper is of great interest, and possibly gains from the fact that each reader is able to form his own conclusions unwarped by any theory of the writer. The impression the article creates in the present reviewer is that the simplest explanation of any pictograph is most likely to be the right one, and any forced or symbolical interpretation is apt to violate the nature of at least the Indians of North America. The other articles of the volume relate to pottery. Three by Mr. William H. Holmes deal respectively with

¹ Fourth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1882-83, by J. W. Powell, Director. 4to, pp. 63 + 532, pls. 83. Washington, 1886 (1887).

the "Pottery of the Ancient Pueblos," the "Ancient Pottery of the Mississippi Valley," and as a corollary thereto the "Origin and Development of Ornament in Ceramic Art." Mr. F. H. Cushing gives a study of Pueblo pottery as illustrative of Zúñi culture-growth. These papers afford ample illustrations of the laws already laid down of the development of the ceramic art, and are to be regarded as proving and confirming the gradual evolution of the potter's trade, rather than as advancing new ideas. This, however, must not be taken as adverse criticism, but, on the contrary, as a recognition of an important point in the articles. In connection with them the reader should refer to Professor F. W. Putnam's recent paper on "Conventionalism in Ancient American Art" (*Bulletin Essex Inst.*, xviii., 1887), to which we shall have occasion to refer again.

Beal's Grasses of North America.¹—This volume is, in fact, Part I. of a large work the second part of which, we are informed in the preface, is in preparation. When completed it will be the most important work on grasses ever brought out in this country. The part before us includes seventeen chapters devoted to the following subjects,—viz., structure, form, and development of grasses; the power of motion in plants; plant-growth; classifying, naming, describing, collecting, studying; native grazing-lands; grasses for cultivation; early attempts to cultivate grasses; testing seeds; some common weeds; grasses for pastures and meadows; preparation of the soil, and seeding; care of grass-lands; making hay; look the world over for better grasses, and improve those we now have; grasses for the lawn, the garden, and for decoration; the Leguminosæ, pulse family; the enemies of grasses and clovers; the fungi of forage-plants.

It will thus be seen that the range of topics is much wider than that which we usually find in books designed for popular use. In fact, it is doubtful whether many farmers will care much for the first three or four chapters; but, for all that, it is a hopeful sign when an author who is as well acquainted with the farming classes as Dr. Beal is, will deliberately open his book with a scientific discussion of structure, form, and development. Many a farm boy, in consulting this book, will be inspired with a desire to learn more about the methods of scientific study.

In the first chapter there are many matters touched upon which are interesting to the scientific botanist. The closed sheaths of some grasses and the partially-closed ones of many others are referred to, and some interesting figures are given. The mech-

¹ Grasses of North America, for Farmers and Students, comprising chapters on their physiology, composition, selection, improving, cultivation, management of grass lands; also chapters on clovers, injurious insects, and fungi. By W. J. Beal, M.A., M.Sc., Ph.D., Professor of Botany and Forestry in Michigan Agricultural College. Published and copyrighted by the author. Agricultural College, Mich., 1887. Pp. xiv. 457, with 175 figures. Price, \$2.50.